Networking @ Sun

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  - I really don’t hate ENS...

A Little Bit About Sun

- Founded in 1982 to build network-ready off-the-shelf workstations
  - Originally stood for “Stanford University Network”!
- We’ve been an active participant in the TCP/IP Internetworking evolution
- We remain a significant platform for Internet and Web servers

Some Relevant and Important Innovations

- NFS for shared file systems
- NeWS for more efficient client / server graphics (too bad it *didn't* take off!)
- WebNFS (too bad is *hasn't* taken off!)
- … Java
  - Looks like this one *is* taking off…
  - With lots of spin-off technologies

Sun microsystems

The Sun Wide Area Network

- Worldwide access across all Sun offices and sites
- We conduct all of our business across the SWAN
- Multi-levels of security precautions
  - Our intellectual wealth resides on it
  - We are constantly under attack
  - We don’t restrict Java user internally or externally!

The Evolution of the SWAN

- Ancient history (I.e., 10 years ago): uucp over dialup modems
  - Offices had thick-net LANs
  - “tstech” was the internal technical alias
  - “pitstop” and “newstop” were our central data archives
    - » uuput/uuget for pitstop
    - » ftp for newstop
  - We shipped lots of paper back-and-forth

The Evolution of the SWAN

- Field offices *evolved* to leased lines
  - *Newsware* provided client/server searchable access to documents
  - Results were batch emailed back
  - Lots of local modems for home use
  - System administration done locally
- We discovered that local modems weren't such a great idea
  - The first solution was dial-back modems
  - The second solution was authentication cards

The Evolution of the SWAN

- The SWAN was born approx. 1987
  - T1, fractional T1 and slower solutions, depending on locality
  - Worldwide support
  - The birth of ENS: Enterprise Network Services
  - “SoftDist” standardized applications across Sun
  - Client / Server tools abound
  - Support becomes regionally centralized

The Evolution of the SWAN

- Web pages start taking hold…
  - First totally random, *ad hoc*
  - www.sun.com provides external web page
  - ***Newsware*** evolves to web-based ***SunWin***
  - Increasingly centralized: the Grand Central of web pages is "***SunWeb***"
  - ENS ***thinks*** they should control internal web pages!
- Centralization of support continues

Some Interesting Statistics

Users	25,657
Nodes	32,339
Servers	1,097
Desktops	30,344
Home Systems	8,360
Nomadic Systems	1,320
Dial-up Users	8,250
ISDN Users	1,540
Sys Admin per System	1:175
Sys Admin per User	1:125
Trouble Tickets	35K / Qtr

Figures based on Sun's Fiscal Year 1998

Some SWAN Rules

- Access is limited to employees and temporary contractors
- Usage must be for valid business purposes
- Incidental or off-hours personal usage is permitted as long as it doesn't interfere with performance or business needs
- No one may conduct any non-Sun business over the SWAN

More SWAN Rules

- No third-party access is permitted
  - Special extranet for suppliers
- Putting a modem on the SWAN is a ***BIG*** no-no!
- No email should be forwarded over insecure links outside SWAN
- Sun complies with all copyright laws
- All software must have valid licenses
- ENS is exclusively responsible for the selection and deployment of encryption

Sun Culture

- “To ask is to seek denial”
- Ignore authority
- We can do it ourselves

Some Famaliar Complaints

- Not enough modems
- Information on the Web is always out-of-date
- Can't find the necessary information on the Web
- The *right* information isn't on the Web
- Security is too restrictive
- Services cost too much
- We are too slow to adopt new technology

So what's new?

Some Trends at Sun

- We’re very focused on our expenses
- There have never been enough resources
- We are expected to do more with less
  - (There *will* never be enough resources)
- Software development in Java
- We are growing increasingly nomadic
- Sun on Sun

Some Things We've Tried

- More search engines
- Thin clients
- Java tools
- Server-side Java
- Virtual private networking

Search Engines

- Search engines are supposed to save time...
- Search engines remain an important solution
- Multiple search engines that cover different domains
- Ultimately the user has to filter the results

And the results are usually binary: nothing or too much!

Thin Clients

- Thin clients have the potential to lower costs by providing highly centralized deployment and administration
- Thin clients are … ***thin!***
- Top level managers and volunteers have tested have > 1000 units with “mixed” results

Thin Clients - a Rough Start

- Lack of OS robustness
- Inadequate performance
- Missing features (like printing)
- Lack of software
- Software that is … too ***thin***!

Thin Clients - Lessons Learned

- Don’t make a thin client into a thick client
- Don’t assume users are willing to live with a smaller feature set

But there is hope!

- Faster boxes and networks
- JDK 1.2 features
- More Java software

Java Tools

- Java ***applets*** support client-server applications with automatic distribution via the Web
- We are getting better software productivity with Java
- The browser is the ideal desktop integration

Java Tools - Lessons Learned

- Occassional runtime problems
- Applications run slower than their predecessors
  - We need faster desktops with more memory
- Some applications require ***HotJava*** browser instead of Netscape Navigator to take advantage of latest JVM release

Java Tools - We're Forging Ahead

- We ***want*** to program in Java
  - We are getting better productivity
- JVMs and hardware are getting faster
- Java tools eliminate dependance on client platforms
  - Providing better nomadic access

Server-side Java

- We are all discovering the ***myth*** of two-tier computing
- Java is a ***very*** successful server-side technology
- Developing standards, like Enterprise Java Beans will continue that direction
- HTML, DHTML, XML and other technologies may be the better client-side solutions

Sun.Net

- Sun is testing virtual private networking via it's internal ***Sun.Net***
- Accessible from any external Internet with a JDK 1.1 compliant browser and shttp
  - Requires the same authentication card used for remote access

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Sun.Net

EARLY ACCESS PROGRAM

What's Sun.Net?

- What's Sun.Net?
- Products
- Support
- FAQs
- Feedback

Be Sure To Logout When You Are Finished

LOGOUT

Introducing Sun.Net Internet Business Computing

Sun.Net is an Internet product that provides regular Sun employees with secure access to Sun's web-based resources through the public Internet from a Java-enabled, SSL (Secure Socket Layer) supported web browser.

Introducing *Sun.Net 1.1*

Now Hear This

sun.net imminent change notice

General Sun.Net Change Notices and Announcements:

Change Notices Log

Life @ Sun

- Networking is our business
- We run our business on our network
- Sun will continue to innovate with Java
- Sun will continue to embrace and apply new Internet and Web technologies


Sun